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THE RELATIONSHIP OF MEASURES OF ATTAINMENT VALUE AND ACHIEVEMENT EXPECTANCY TO THE READING ACHIEVEMENT OF FIRST-GRADE CHILDREN FROM LOW-INCOME FAMILIES.

BY- WOOD, FRANK H.
MINNESOTA UNIV., MINNEAPOLIS
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DESCRIPTORS- *READING RESEARCH, *READING ACHIEVEMENT, *STUDENT MOTIVATION, *GRADE 1, *CULTURALLY DISADVANTAGED, INNER CITY, SEX DIFFERENCES,

THIS INVESTIGATION FOCUSED ON THE USEFULNESS OF A PROCEDURE FOR OBTAINING MEASURES OF THE MOTIVATION OF FIRST-GRADE CHILDREN FROM LOW-INCOME FAMILIES TO ACHIEVE IN READING WHICH DID NOT REQUIRE WRITTEN OR ORAL VERBAL RESPONSES FROM THE SUBJECTS. MEASURES OF ACHIEVEMENT MOTIVATION WERE CORRELATED WITH TEACHER RATINGS OF EFFORTS TO ACHIEVE IN READING AND ACTUAL READING ACHIEVEMENT AS MEASURED BY STANDARDIZED TESTS ADMINISTERED AT THE END OF FIRST GRADE. THE SAMPLE WAS 70 FIRST GRADERS FROM THREE CLASSROOMS IN TWO INNER CITY SCHOOLS IN MINNEAPOLIS, MINNESOTA. THE READING ACHIEVEMENT MOTIVATION SCORES SHOWED MODERATE STABILITY, BUT CORRELATIONS WITH THE MEASURES OF ACHIEVEMENT EFFORTS WERE LOW. ATTAINMENT VALUE MEASURES CORRELATED MOST HIGHLY WITH CONCURRENT MEASURES OF ACHIEVEMENT AND EFFORTS, WHILE ACHIEVEMENT EXPECTANCY MEASURES HAD STRENGTH AS PREDICTIVE MEASURES. STRONGER PATTERNS OF RELATIONSHIP WERE FOUND FOR GIRLS AS CONTRASTED WITH BOYS AND FOR WHITE SUBJECTS AS CONTRASTED WITH NEGRO AND INDIAN SUBJECTS. SCATTERGRAMS INDICATED U-SHAPED DISTRIBUTIONS WITH HIGH AND LOW ACHIEVERS REPORTING HIGH MOTIVATION TO ACHIEVE. IT WAS NOTED THAT THIS GROUP OF INNER CITY FIRST GRADERS REPORTED GENERALLY HIGH MOTIVATION TO ACHIEVE. APPENDIXES, TABLES, AND A BIBLIOGRAPHY ARE INCLUDED. (AUTHOR/BK)

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The Relationship of Measures of Attainment Value and Achievement Expectancy to the Reading Achievement of First-Grade Children from Low-Income Families

SEPTEMBER 1967

WOOD, FRANK H.

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Frank H. Wood

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University of Minnesota

Minneapolis, Minnesota 55455

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I. INTRODUCTION

A. Background.

Children from low-income families are known to be educationally disadvantaged in the sense that they achieve less well in school than children of the same chronological age from middle-income families. Differences in mean school achievement appear early in these children's school careers and persist or become greater, varying directly with the number of years in school (1, 12, 26).

The research upon which a satisfactory explanation for the development of these differences might be based is not complete. Among the factors that have been stressed by various researchers are: parental attitudes toward education and the school (5), peer group pressures (31), middle-class bias of the schools (20, 26), female sex-typing of school activities (22, 26), social-class-related differences in cognitive development (14, 29), social-class-related differences in vocabulary development (9, 15), and patterns of communication (13). While presumably the influence of many of these factors would be revealed by differences in the motivational determinants underlying the intensity and direction of young children's efforts to achieve in school, most of the existing research has been carried out with older subjects. Downward generalization from this research without collaborative evidence is risky.

B. The Problem.

Research on the relationship between young children's motivation to achieve at school tasks and their achievement efforts and actual achievement on such tasks is dependent on the development of a satisfactory research methodology. The major methodological problems to be resolved in undertaking such research with young children are choice of a theoretical formulation that gives promise of fruitfulness and choice of a measuring procedure appropriate for use with young children. Recently, Crandall, Katkovsky, and Preston (6), have proposed a theory of achievement behavior in children and made promising applications of it to the study of children's motivation to achieve. In an earlier study, the present investigator obtained measures of the value placed on achievement in various school activities by subjects differing in sex, grade in school, and socioeconomic background, using a procedure that did not require skill in reading or writing (33). The present investigation continued this research using an elaborated and refined version of the procedure used in the earlier research.

The focus of this investigation was on motivation to achieve in an area of the school curriculum of central concern to teachers, parents, and children in the early years of school -- reading. The general question explored in the investigation was whether or not it was possible to obtain a measure of the cognitive-affective dimension of the achievement attitudes of first-grade children that would be strongly related to their efforts to achieve in reading and their actual achievement in that academic area.

C. Related Research.

The theory of achievement behavior proposed by Crandall, Katkovsky, and Preston (6), hypotheses from which have been tested in research with young children, is based in large part on the "Social Learning Theory" proposed by Rotter (24). This theory for predicting behavior in complex social situations employs three constructs: (1) "behavior potential" defined as "the potentiality of any behavior occurring in any given situation as calculated in relation to any single reinforcement or set of reinforcements;" (2) "expectancy" defined as "the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations;" and, (3) "reinforcement value" defined as "the degree of preference for any reinforcement to occur if the possibilities of this and other reinforcements are equal" (23, P. 171). Rotter has related these three constructs in the following formulation:

$$B.P._{x,s_1,R_a} = f\ (E._{x,s_1,R_a}\ \&\ R.V._{a_1,\ s_1})$$

"This formula may be read as follows: The potential for behavior *x* to occur in situation 1 in relation to reinforcement *a* is a function of the expectancy of the occurrence of reinforcement *a* following behavior *x* in situation 1, and the value of reinforcement *a* in situation 1" (23, p. 171).

In Rotter's theory, reinforcers possess their potency not because they are related to an internal drive but because of the organism's "need potential," which is defined as a "potentiality to respond with any one of a set of functionally related behaviors directed towards one or more of a functionally related set of reinforcements" (23, p. 171). Reinforcers are "functionally related" if one changes as a result of a change in the strength of the other. The idea of "functionally related behaviors" and "functionally related reinforcers" thus seems to bear a relationship to what in other learning theories are called "habit hierarchies" and "reinforcement hierarchies."

Rotter's formulation stresses the influence of a specific situation on the behavior of the organism. The situational subscript (s) appears with each of the terms in the formula. The behavior is also assumed to be goal-directed, and hence the occurrence of the subscript (R) with each of the first two terms of the formula. On the basis of these characteristics, Atkinson (2), in his recent discussion of theories of motivation, includes Rotter's "Social Learning Theory" in the more general category of "expectancy x value" theories, together with those of Tolman, Lewin, Edwards, and himself.

Basing their conceptualization on Rotter's theory, Crandall, Katkovsky, and Preston (6) developed their theory of children's achievement behavior. Crandall, Katkovsky, and Preston define "achievement behavior" as "behavior directed toward the attainment of approval or the avoidance of disapproval (the goal) for competence of performance (characteristic of the behavior) in situations where standards of excellence are applicable" (6, p. 789). In this definition, the goal-directed and situational emphases characteristic of Rotter's formulation are apparent. The definitional restriction to behaviors where approval and disapproval are the defining cues for judging competence of performance and the potential reinforcers of performance is recognized by Crandall and his associates as a possible limitation in considering the development of achievement behaviors from preachievement behaviors.

Crandall and his associates assume that achievement behavior is motivated by a "need for achievement" that develops during early childhood as a result of the interaction of socially defined patterns of reinforcement with behavior arising from primary and secondary need systems. They state that their research and that of others indicates that "by nursery school age or early grade school age, individual differences are apparent in the strength of children's achievement needs, in the achievement standards they have incorporated, and in the techniques they have acquired to attain various achievement goals" (6, p. 788). Through their formulation of the determinants of achievement behavior, Crandall and his associates hope to clarify the relationships between such individual differences in needs, standards, and techniques and individual differences in achievement behavior.

Crandall, Katkovsky, and Preston (6) have defined three motivational determinants of individual differences in achievement behavior: (a) attainment value, (b) achievement standards, and (c) achievement expectancies. "Attainment value" is defined as "the importance that an individual attaches to the attainment of approval and the avoidance of disapproval regarding the competence of his performance in a given achievement area" (6, p. 791).

This reference to a "given achievement area" reflects not only the situational emphasis of Rotter's theory but also Crandall and his associates' empirical finding that children's attainment values for approval and disapproval differ according to the area of achievement. Five "possible" achievement areas are mentioned: intellectual, physical skills, artistic'creative, mechanical skills, and social. Motivation to achieve in reading would be classified under the intellectual area. "Achievement standards" are conceptualized as varying with both the individual and the nature of the activity. They are more often "subjective" than "objective". Crandal, Katkovsky, and Preston define them as "a scale of excellence against which the competence of an individual's achievement efforts may be evaluated" (6, p. 792). A measure of achievement standards was not included in the present investigation. The third construct, "achievement expectancy," is defined as "the probability held by the individual that his achievement efforts will lead to goal attainment" (6, p. 795).

Crandall and his associates feel that predictions of specific achievement performances in children may be made more accurately from such multiple-determinants of achievement motivation than from a single construct such as n Achievement. The distinction among "areas of achievement behavior" is also intended to facilitate such predictions. Relating Crandall's formulation to that of Rotter, we may say that the "expectancy" construct suggested by Rotter has been subdivided into "achievement standards" and "achievement expectancy," while "reinforcement value" has been renamed "attainment value" so as to more accurately describe its relationship to achievement behavior. Thus, the new formulation is more specific than that suggested by Rotter. Proceeding on the basis of this formulation, Crandall and his associates have attempted to make predictions about the direction and intensity of various kinds of achievement behavior in young children.

In a series of research studies, Crandall and his associates have explored the relationship between measures of their three hypothesized motivational determinants of children's achievement efforts to experimenter ratings of childern's achievement efforts in naturalistic and structured situations, to their achievement and intelligence test scores, and to parental expectations for evaluations of standards for their performance. Their research has used various experimenter-developed procedures for measuring the postulated motivational determinants, including questionnaires and ratings of interview protocols. Related research studies have been carried out by Battle (3) and Stiles (28).

In a study of motivational and ability determinants of intellecutal achievement behaviors in first, second, and third grade children, Crandall, Katkovsky, and Preston (7) found that their theory-dictated measures of the three determinants of children's achievement behavior (attainment value, achievement expectancy, and achievement standards) were better predictors of children's achievement efforts and performance than a TAT-derived measure of "achievement motivation". The measure of attainment value was not significantly related to measures of either achievement expectancy or achievement standards. However, measures of the latter two constructs were highly correlated. Because of this intercorrelation, it was decided to dispense with a measure of achievement standards in this investigation.

In a study of seventh, eighth, and ninth grade children, also based on Crandall, Katkovsky and Preston's theoretical formulation, Battle (3) investigated the relationship of paper and pencil measures of relative and absolute attainment value of mathematics achievement, expectancy for achievement in mathematics, goal certainty, and social desirability to persistence in efforts to solve a difficult mathematical puzzle. Inter-relationships among the hypothesized determinants of task persistence were also studied and measures of them were correlated with the subject characteristics including socioeconomic class of the subjects. Of particular interest in connection with the present investigation are the findings that: (a) expectancy scores correlated positively and significantly with the task persistence and actual grades; (b) neither attainment value score correlated significantly with task persistence or other measures (a fact which Battle feels may have been due to the lack of precision of the measures themselves); (c) absolute attainment value did correlate with social class and, in addition, boys' task persistence was found to be related to social class.

As has been already mentioned, Crandall, Katkovsky and Preston did not find a Thematic Apperception Test measure of achievement motivation to be a good predictor of children's achievement efforts and performance (7). A major problem they encountered was the sparse protocols elicited from the children by the TAT stimulus cards. Stiles (28) felt that this did not mean that projective techniques could not be useful in measuring achievement motivation in children. She felt that materials must be developed that were suited to the particular group of children being studied. In particular, she felt that unambiguous stimulus cards would be necessary. Therefore, for a study of the reading achievement motivation of first-grade children, she developed four cards picturing specific aspects of the reading situation. These cards were used in a TAT-type procedure to elicit verbal responses that were assumed to be indicative of children's reading achievement motivation. Her scoring of the subject protocols was based on Crandall, Katkovsky and Preston's theory. She obtained scores of attainment value and achievement expectancy, but did not score the protocols for achievement standards. However, she added a new variable, "achievement situation," defined as "the degree to which the individual is aware of and involved in the achieving aspects of an academic situation" (25, p. 10). She further differentiated between general and specific factors of attainment value, achievement expectancy, and achievement situations. Scores of hypothesized motivational determinants of reading behavior were related to children's scores on reading achievement tests.

Stiles found that boys' reading achievement motivation scores were generally higher than those of girls. The reading achievement test scores of girls were only slightly higher than those of boys. In general, she found that the relationship between the motivation scores she obtained and actual reading achievement was consistently higher for boys than it was for girls. She cites Sears (25) as suggesting that this may be because the affiliative motive is more important than the achievement motive for girls. She concluded that high attainment value scores were related to high performance on familiar reading tasks in familiar situations. High attainment value, high achievement expectancy, and an absence of negative achievement situation tendencies (interpreted as withdrawal tendencies) enhance performance on novel reading tasks in novel situations. Her conclusion with regard to girls was more complicated. Stiles feels that the pattern of relationships revealed in her study, and the related factor analysis, indicate that reading achievement motivation, whether considered as a global, general, or a specific construct, is very complex and not a simple combination of attainment value, achievement expectancy, and achievement situation factors. She suggests that future studies of achievement motivation might use partial and multiple correlation approaches.

The present investigator used Crandall, Katkovsky and Preston's formulation as a theoretical framework in planning an earlier study of the value placed on achievement in school activities by early elementary level boys and girls differing in socioeconomic background and grade level (33). In that study a procedure was developed for measuring the value placed on successful achievement in various school activities. First- and third-grade subjects responded to pre-recorded questions by indicating which of two figures felt about achievement in the activity as the questions indicated. This procedure was similar to that used by Kagan and Lemkin (16) and Emmerich (11) in studies using subjects as young as three-and-a-half years old. The procedure developed was well within the range of capability of all the subjects, including those from four schools in low-income neighborhoods of Minneapolis, Minnesota. This investigation showed sex differences in the value placed on achievement in non-academic school activities but not in academic school activities, including reading. There were no socioeconomic group differences. In this connection, it might be mentioned that Stiles found that socioeconomic status, social desirability, chronological age, and teacher effects either loaded alone or on their own factor, or loaded with each other, but did not load to any appreciable degree with reading performance or motivation. In the present investigator's earlier study, neither a measure of the subject's achievement expectancies in the activities used in the questions nor a measure of achievement efforts in these activities was obtained, but subjective observations suggested that achievement expectancy might be a better predictor of both achievement efforts and actual achievement than attainment value. In addition, the importance of making a distinction between aspiration (attainment value) and expectancy in studies of low-income groups has been stressed by Weiner and Murray (30).

In summary, descriptive studies indicate significant mean differences in academic achievement associated with differences in socioeconomic background and sex. The exact causation of these differences is not fully understood, although it is presumably multiple rather than simple in nature. A conceptualization of hypothetical determinants of children's achievement efforts suggested by Crandall, Katkovsky and Preston provides an appropriate theoretical framework for a more precise investigation of the relationship between children's overtly expressed motivation to achieve in school activities and their actual achievement level and achievement efforts. Appropriate procedures for obtaining measures of the variables involved that do not require skill in reading or writing from the subjects have been developed by several researchers. The proposed investigation explored the usefulness of an extension of one of these procedures.

D. Objectives of the Investigation.

Crandall, Katkovsky, and Preston (6) have put forward a theory postulating variables underlying motivation to achieve in young children. In the present investigation it was hypothesized that measures of two of these variables would be useful predictors of the reading achievement behavior of first-grade children from low-income families. These two variables, as defined by Crandall, Katkovsky, and Preston, are: (a) "attainment value," defined as "the importance that an individual attaches to the attainment of approval and the avoidance of disapproval regarding the competence of his performance in a given achievement area, and (b) "achievement expectancy" defined as "the probability held by the individual that his achievement efforts will lead to goal attainment." Procedures were developed for defining operationally the "attainment value" placed on achievement in one area of intellectual activity, reading, and the "expectancy for successful achievement" or "achievement expectancy" in this subject area by first-grade children from low-income families.

The investigation had two major objectives: First, to study the reliability, and construct and concurrent criterion-related validity of the measures of reading achievement motivation and reading achievement effort obtained. What are the measurement characteristics of the scores, and how do they relate to children's efforts to achieve in reading and to their actual achievement in reading? Second, to study the predictive criterion-related validity of the scores. What value do pupils' attainment value and achievement expectancy scores obtained at the time of beginning reading instruction have as predictors of their end-of-the-year reading achievement? Thus, the focus of the present investigation was on the practical value of the measures used to a greater extent than it was on their theoretical fruitfulness.

Less central to the investigation was an interest in the relationship of the measures to population characteristics. Does variation related to sex, race, or classroom group exist between the mean reading achievement motivation scores?

In Part F of this section of the report, all these objectives are restated as specific hypotheses.

E. Definitions.

1. Reading achievement motivation: Reading achievement was defined operationally by scoring pupil answers to questions intended to elicit responses indicative of cognitive-affective attitudes toward four aspects of the first-grade child's reading experience. Three scores were available for each subject. Two were part scores for reading attainment value and reading achievement expectancy. The third was a total reading achievement motivation score obtained by adding the two part scores.

2. Reading achievement efforts: Reading achievement efforts were defined operationally as teacher ratings of pupils' efforts to achieve in reading made using a forced stanine procedure.

3. Reading achievement: Reading achievement was defined operationally as pupil scores on a standardized test of reading achievement. The test used yields three part scores for word recognition, comprehension of significant ideas, and comprehension of specific instructions. The three part scores were summed to yield a total reading achievement score.

The procedures followed in obtaining these scores are described more completely in the Method section of this report.

F. Hypotheses.

Tests of the following hypotheses were made for the total sample and for sex, race, and classroom subgroup as appropriate.

1. Reliability of measures of reading achievement motivation and reading achievement efforts:

   (a) Test-retest reliability of measures of reading achievement motivation (January-March): Reading achievement motivation scores obtained in January are positively related to the same scores obtained through retesting in March. (This hypothesis is to be tested for a subgroup of the total sample.)

   (b) Test-retest reliability of measures of reading achievement motivation (January-May): Reading achievement motivation scores obtained in January are positively related to the same scores obtained through retesting in May.

   (c) Test-retest reliability of ratings of reading achievement efforts (January-May): Ratings of reading achievement efforts made in January are positively related to similar ratings made in May.

2. Construct validity of measures of reading achievement motivation:

   (a) Independence of measures of attainment value and achievement expectancy: Attainment value and achievement expectancy scores obtained in January and in May are not related.

3. Criterion-related validity of measures of reading achievement motivation and measures of reading achievement efforts and reading achievement (concurrent):

   (a) Relationship between measures of reading achievement efforts and reading achievement: Ratings of reading achievement efforts obtained in May are positively related to reading achievement test scores obtained in May.

   (b) Relationship between measures of reading achievement motivation and reading achievement efforts: Reading achievement motivation scores obtained in January and in May are positively related to ratings of reading achievement efforts obtained in January and in May.

(c) Relationship between measures of reading achievement motivation and reading achievement efforts: Reading achievement motivation scores obtained in May are positively related to reading achievement test scores obtained in May.

(d) Differences in strength of relationship between measures of reading achievement motivation and reading achievement efforts obtained in January and in May: The relationship between reading achievement motivation scores and ratings of reading achievement efforts will be stronger and more positive in May than in January.

4. Criterion-related validity of measures of reading achievement motivation and reading achievement efforts and reading achievement (predictive):

(a) Relationship between measures of reading achievement motivation and reading achievement efforts: Reading achievement motivation scores obtained in January are positively related to ratings of reading achievement efforts obtained in May.

(b) Relationship between measures of reading achievement motivation and reading achievement: Reading achievement motivation scores obtained in January are positively related to reading achievement test scores obtained in May.

5. Differences in measure mean scores related to sample characteristics:

(a) Differences between classroom group mean scores: There are no differences between the mean reading achievement motivation, reading achievement effort, and reading achievement test scores of pupils in different classroom groups.

(b) Differences between sex group mean scores: There are no differences between the mean reading achievement motivation, reading achievement effort, and reading achievement test scores of boys and girls.

(c) Differences between racial group mean scores: There are no differences between the mean reading achievement motivation, reading achievement effort, and reading achievement test scores of the Indian, Negro, and white groups.

(d) Interaction effects: No interactions between the main effects of classroom group, sex, and race, will be found in analyses of the significance of mean score differences.

II. METHOD

A. Design and Sample.

The purpose of this investigation was to study the motivation to achieve in reading of first-grade children from low-income families, a high proportion of whom might be classified under the less specific label of "culturally disadvantaged." The general population with which this investigation was concerned was those children living within the designated low-income, poverty "target area" of Minneapolis, Minnesota. Within the Minneapolis "target area", two elementary schools were selected with the advice of the Director of Research for the Minneapolis Public Schools. The schools chosen are located on Minneapolis' north side and share a common boundary on one side. Both lie well within the poverty area of the city.

A general picture of this area can be obtained from the booklet, "Profile of Minneapolis Poverty Areas," prepared by the Research Department of the Community Health and Welfare Council of Hennepin County in 1965 (21). The maps and tables in this booklet, based in part on 1960 census data and in part on more recent surveys of the areas described, indicate that the two schools lie in an area having relatively high percentages of demographic characteristics chosen as indices of poverty when compared to the city as a whole: higher percentages of low-income families, families with working mothers, families receiving AFDC, and unemployed or poorly educated adults; higher percentages of minority, non-white racial groups, broken homes, substandard and overcrowded housing, and juvenile delinquency. Although one of the school neighborhoods has been affected by demolition of houses for freeway construction, neither has been affected by large scale urban renewal projects in recent years, and there is some reason to believe that the neighborhoods show the stamp of urban poverty more strongly now than in 1960.

The basic design of the investigation called for the collection of measures of the motivation of first-grade pupils to achieve in reading, ratings of their efforts to achieve in reading, and their reading achievement at two different times during the first-grade school year: First, when the pupils were just beginning formal reading instruction (as distinguished from reading readiness instruction), and again at the end of the first-grade school year. The periods during which data were collected were January 23 through February 3, 1967, and May 29 through June 7, 1967. The standardized reading test used as a measure of achievement was administered only during the May -- June period. All other measures were collected in both periods, referred to as "January" and "May" for convenience in this report. For the purpose of obtaining data bearing on short-term test-retest reliability of the reading achievement motivation scores, this part of the total battery was administered to the pupils of one room during the period, March 15 through March 17, 1967. The complete testing schedule is shown in Table I. Permission was obtained from parents of children tested.

Sampling for this investigation was done on a classroom basis. One of the schools chosen has a relatively small pupil population. At this school, labeled "School A" in this report, all of the only first-grade class, "A-1", was selected for study. In addition, a smaller group of first-grade children from a first-second-grade combination room, "A-2", were included in the study. (Ratings of efforts to achieve in reading were not collected from this small group because of the inapplicability of the forced stanine procedure.) At the other school, labeled "School B" in this report, one of the first grades, "B-1", was chosen after consultation with the principal. The teacher of classroom group B-1 was Negro. The teachers of groups A-1 and A-2 were white. School A's building is 74 years old, though well-maintained. School B is housed in relatively new building, opened in 1960. Both schools offered hot lunch programs during the 1966-1967 school year. Cooperation by all three teachers and the principals and staffs of the buildings concerned with investigation was excellent.

A breakdown of the sample by classroom group, sex, and racial group is shown in Table II. Efforts were made to obtain every measure on every pupil enrolled in a given class at the time of testing. These were largely successful. However, both School A and School B have high rates of pupil turnover. This made it impossible to collect complete data for both January and May from all pupils. Partial data is available for 41 boys and 29 girls, a total of 70 subjects. Complete data, however, is available from only 39 subjects because of pupil turnover and absenteeism.

Available racial data on the population of the two schools had led the investigator to anticipate a larger proportion of Negro children. Some of the planning outlined in the proposal reflected this presupposition. In actuality, Indian rather than Negro pupils constituted the largest non-white minority group in the sample. Most of the Indian children in this sample were members of one or another Minnesota Chippewa band.

B. Analysis.

The instability of the sample created problems in planning for the analysis of the data. As mentioned, complete data were

TABLE I: Testing Schedule, January - May 1967.

Measure	January	March	May
Reading Achievement Motivation	X	X*	X
Reading Achievement Efforts	X		X
Reading Achievement Test			X

*Administered only to pupils in Room A-1.

TABLE II: Number of Pupils Classified by Sex, Race, and Classroom Group From Whom Data Were Collected in January and May 1967.

	January				May			
	White	Negro	Indian	Total	White	Negro	Indian	Total
A-1								
Boy	12	--	3	15	12	1	1	14
Girl	4	1	1	6	3	1	3	7
Class Total	16	1	4	--	15	2	4	--
A-2								
Boy	1	--	1	2	1	1	1	3
Girl	3	--	3	6	2	--	3	5
Class Total	4	--	4	--	3	1	4	--
B-1								
Boy	7	4	4	15	8	3	4	15
Girl	5	1	5	11	7	1	4	12
Class Total	12	5	9	--	15	4	8	--
Totals	32	6	17	--	33	7	16	--
Grand Totals	55				56			

available for a total of 39 pupils. Restriction of the analysis to this group of pupils would make it necessary to ignore possible effects related to classroom and racial subgroup. Therefore, a decision was made to use all data available for any given analysis. Such a procedure constitutes a major qualification on a discussion of the significance of the results, since in effect a variety of different subsamples are being analyzed rather than one large sample. However, it was felt that this best fitted the exploratory objectives of the investigation.

The date bearing on hypotheses 1, 2, 3, and 4, concerned with the validity and reliability of the measures of reading achievement motivation and reading achievement efforts, were analyzed using UMSTAT 530, a program for the correlation of incomplete data. Frequencies available for each correlation are given. The data bearing on hypothesis 5 were analyzed using UMSTAT 610, a program for analysis of variance in cases with unequal cell frequencies. A separate analysis of variance was done on each of twelve variables of interest listed in Table III.

The .05 level of probability of rejecting a true hypothesis as false was set as the critical level for accepting or rejecting hypotheses of no mean differences or no correlation. For directional hypotheses, the .025 level was used.

C. Measuring Procedures Used.

1. Motivation to achieve in reading: Measures of reading attainment value and reading achievement expectancy were obtained in January and again in May. The procedure followed involved a standardized interview during which the subject answered questions by placing small cards showing outline figures of boys and girls on a series of steps. This procedure was developed by the investigator. The figures are shown in Appendix A. As used, they were drawn on 4" x 4" beige cardboard. Four figure cards were used: two of the girl and two of the boy figure. The like-sex pairs were distinguished by coloring one of the girl's dresses and one of the boy's shirts red, and the other blue. The subject answered questions asked by the experimenter by placing the cards on four steps (4" wide with a 2" rise), following the instructions of the experimenter.

Four questions focusing on the attainment value a subject placed on successful achievement in reading were asked. Each of the questions was followed by a question about the subject's expectancy for achievement in the given area. The four areas of reading used for the questions were: "reading with a group", "answering questions about what is read in a book", "reading a story aloud to other children", "doing reading workbooks at the desk." The questions and introductory statements used are given in Appendix A.

TABLE III: Sets of Scores Analyzed by Three Way Analyses of Variance (Sex x Race x Classroom Group).

Reading Achievement Motivation Scores:

1. January Attainment Value Scores.
2. January Achievement Expectancy Scores.
3. Total Reading Achievement Motivation Scores.

4. May Attainment Value Scores.
5. May Achievement Expectancy Scores.
6. Total Reading Achievement Motivation Scores.

Ratings of Reading Achievement Efforts:

7. January Ratings of Reading Achievement Efforts.
8. May Ratings of Reading Achievement Efforts.

Reading Achievement Test Scores:

9. Scores from Part I: Word Recognition.
10. Scores from Part II: Comprehending Significant Ideas.
11. Scores from Part III: Comprehending Specific Instructions.
12. Total Reading Achievement Test Scores.

After the figures were placed on the steps, the subject was asked to indicate the figure whose feelings about the question asked were "most like" his own. The assumption was made that the subject's answer reflected a projection of his own feelings. The procedure used is described in detail in Appendix A.

The subject's score for each question was determined by the step occupied by the figure that he indicated to be "most like" himself (highest step equals four, lowest step equals one). This procedure yielded measures of both the attainment value and expectancy for successful achievement, depending on the question asked. Preliminary study had indicated that children of first-grade age can order the figures validly when the choice is presented in this manner. Attainment value and achievement expectancy scores can range in value from 4 to 16. Total achievement motivation scores can range from 8 to 32.

2. Ratings of pupil efforts to achieve in reading: Teacher ratings of pupil's efforts to achieve in reading were obtained in January and again in May. A forced stanine procedure was used.

In the forced stanine procedure, the teacher was required to rank order her pupils in an approximately normal distribution along a 9 point scale. The teacher's attention was focused on "efforts to achieve in reading" rather than actual reading achievement. The instructions given to the teacher are presented as Appendix B. The ratings given a pupil following this procedure can range from 1 (low) to 9 (high) with 5 being the most common rating.

Because some questions had been raised about the appropriateness of the use of the forced stanine procedure for the purpose of rating pupil efforts to achieve in reading by readers of the proposal, a short rating scale was developed for the same purpose. On this scale, the teacher rated each pupil's behavior in four areas: "eagerness to participate in reading activities," "persistance in working on reading and reading-related tasks," "interest in looking at books and other reading materials independently," and "interest in listening to stories read by others." A copy of the rating scale is shown as Appendix C. A brief comparison of results obtained using the scale as the measure of pupils' efforts to achieve in reading also is presented in that appendix.

3. Reading achievement: The Bond-Balow-Hoyt New Developmental Reading Test, Form L-I (4), was administered to all pupils in the three classroom groups in June, 1967. This test is intended for use with pupils in Grade One and the first half of Grade Two. The test was chosen because it had been normed on a sample including low-income children from the same geographical area as the target population for this investigation, because it appeared

to have adequate range for the sample being studied, and because it was to be used as part of the Minneapolis Public Schools standard battery administered to all pupils at the beginning of Grade Two. Interform and interpart correlations of the test are given in the test manual (4). These are satisfactory for this kind of test.

The New Developmental Reading Test yields three part scores: (1) Word Recognition (choice of the correct word to accompany a picture); (2) Comprehending Significant Ideas (short paragraphs followed by questions about paragraph content); and (3) Comprehending Specific Instructions (short passages directing pupils taking tests to mark accompanying pictures in a distinctive manner). A total score is obtained by summing the three part scores. The test was administered by classroom teachers to groups of pupils with followup testing of individuals when necessary. Scoring was done by a research assistant associated with the investigation.

III. RESULTS

The results of the investigation have been ordered in accordance with the hypotheses previously stated in Part I of this report. For the most part, relevant results are summarized in tables for convenient reference, but some individual correlations of interest are cited in the text only. Statistical significance of correlation coefficients was determined by consulting the tables in Walker and Lev for small samples (29). Statistical significance of the F statistic was determined by consulting the tables in Dixon and Massey (10). The .05 level of probability was set as the critical value for accepting or rejecting hypotheses of no mean differences or correlation. For directional hypotheses, the .025 level was set for significance.

A. Test-Retest Reliability of Measures.

1. Test-retest reliability of measures of reading achievement motivation (January-March): The procedure for measuring reading achievement motivation was administered to all pupils in January and readministered to the pupils of Room A-1 in mid-March. Scores were obtained for 14 children who had been tested in January. The intercorrelation of the January-March measures are shown in Table IV. The direction of the relationship of the attainment value scores is positive, as had been hypothesized. But the girls' achievement expectancy scores are not stable for this period, with the relationship actually being negative.

TABLE IV: Test-retest Reliability of Reading Achievement Motivation Scores for Room A-1 (January - March).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total class (N:14)	.50*	.00	.39
Boys (N:6)	.37	.59	.82*
Girls (N:8)	.80**	-.65	.19

$*p < .025$
$**p < .005$

2. Test-retest reliability of measures of reading achievement motivation (January-May): Reading achievement motivation scores for January and May were available for 44 pupils. The intercorrelations of these scores are shown in Table V. In general, the direction of relationship is positive as predicted, but is stronger in the case of the attainment value scores than that of the expectancy scores. This tendency of relationship is strong enough to produce a pattern of positive correlation in the total reading achievement motivation scores as well. When the sample is classified by race and correlations calculated for the separate racial subgroups, negative correlations result for the expectancy scores of the Indian and Negro subgroups.

3. Test-retest reliability of ratings of reading achievement efforts (January-May): Ratings of reading achievement efforts were available for 39 pupils of Rooms A-1 and B-1. The intercorrelations of these ratings are shown in Table VI. With the exception of the small subgroup of Negro subjects, the direction of the relationship is positive as hypothesized, and the correlations reach at least the .025 level of significance.

B. Construct Validity of Measures of Reading Achievement Motivation.

1. Independence of measures of attainment value and achievement expectancy: The intercorrelations of the two reading achievement motivation scores, attainment value and achievement expectancy, for January and for May, are shown in Table VII. Contrary to the hypothesis, the general pattern is one of positive relationship for the total groups and for the subgroups of the sample in January. This pattern is, however, much less strong in May. Much of the change seems to have occurred in the pupils of Room B-1 and in the girls rather than the boys.

C. Criterion-related Validity of Measures of Reading Achievement Motivation and Measures of Reading Achievement Efforts and Reading Achievement (Concurrent):

1. Relationship between measures of reading achievement efforts and reading achievement: The correlations between ratings of pupils' reading achievement efforts obtained in May and their total scores on the reading achievement test administered in May are shown in Table VIII. With the conspicuous exception of the girls, the general pattern is one of positive relationship as predicted. For the total group and the larger subgroups, the relationship reaches significance at least the .025 level.

2. Relationship between measures of reading achievement motivation to reading achievement efforts: The relationship between pupils reading achievement motivation scores and teacher ratings of their efforts to achieve in reading are shown in Tables IX and X. The general pattern of relationship is not strong.

TABLE V: Test-retest Reliability of Reading Achievement Motivation Scores (January - May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:44)	.41**	.25	.42**
Room A-1(N:15)	.18	.30	.26
Room A-2(N:7)	-.22	.61	.35
Room B-1(N:22)	.55**	.16	.48*
Boys (N:25)	.33	.34*	.42*
Girls (N:19)	.56**	.03	.48*
Indian (N:13)	.59*	-.14	.20
Negro (N:5)	.64	-.28	.32
White (N:26)	.31	.38*	.49**

*p $<$.025
**p $<$.005

TABLE VI: Reliability of Ratings of Pupils' Reading Achievement Efforts (January - May).

Group or Subgroup	(r)
Total (N:39)	.38*
Room A-1 (N:18)	.61**
Room B-1 (N:21)	.42*
Boys (N:26)	.34*
Girls (N:13)	.48*
Indian (N:10)	.56*
Negro (N:5)	-.03
White (N:24)	.39*

*$p < .025$
**$p < .005$

TABLE VII: Relationship Between Reading Attainment Value Scores and Reading Achievement Expectancy Scores (January - May).

Group or Subgroup	January	May
Total	.55** (N:55)	.29* (N:56)
Room A-1	.45* (N:21)	-.01 (N:21)
Room A-2	.54 (N:8)	-.10 (N:8)
Room B-1	.45* (N:26)	.46* (N:27)
Boys	.59** (N:32)	.44* (N:32)
Girls	.54** (N:23)	-.01 (N:24)
Indian	.43 (N:17)	.35 (N:16)
Negro	.56 (N:6)	.64 (N:7)
White	.66** (N:32)	.25 (N:33)

*$p < .05$
**$p < .01$

TABLE VIII: Relationship Between Reading Achievement Test Total Scores and Ratings of Pupils' Reading Achievement Efforts (May).

Group or Subgroup	(r)
Total (N:46)	.44**
Room A-1 (N:22)	.38*
Room B-1 (N:24)	.57**
Boys (N:28	.49**
Girls (N:18)	.00
Indian (N:13)	.20
Negro (N:5)	.53
White (N:28)	.57**

*$p < .025$
**$p < .001$

TABLE IX: Relationship Between Reading Achievement Motivation Scores and Ratings of Pupils' Efforts to Achieve in Reading (January).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:43)	-.07	.11	.03
Room A-1 (N:20)	-.31	.00	-.18
Room B-1 (N:23)	.21	.26	.28
Boys (N:28)	-.13	.12	-.01
Girls (N:15)	.15	-.06	.04
Indian (N:10)	-.74	-.52	-.84
Negro (N:6)	.05	.49	.29
White (N:27)	.03	.25	.16

TABLE IX: Relationship Between Reading Achievement Motivation Scores and Ratings of Pupils' Efforts to Achieve in Reading (January).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:43)	-.07	.11	.03
Room A-1 (N:20)	-.31	.00	-.18
Room B-1 (N:23)	.21	.26	.28
Boys (N:28)	-.13	.12	-.01
Girls (N:15)	.15	-.06	.04
Indian (N:10)	-.74	-.52	-.84
Negro (N:6)	.05	.49	.29
White (N:27)	.03	.25	.16

TABLE X: Relationship Between Reading Achievement Motivation Scores and Ratings of Pupils' Efforts to Achieve in Reading (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:46)	-.09	-.08	-.11
Room A-1 (N:20)	.06	-.08	-.02
Room B-1 (N:26)	-.29	-.11	-.23
Boys (N:27)	-.02	-.03	-.03
Girls (N:19)	-.10	-.50	-.41
Indian (N:12)	-.10	-.39	-.31
Negro (N:5)	-.30	-.71	-.59
White (N:7)	-.01	.07	.04

Contrary to the hypothesis, there is a tendency for the relationship to be negative, particularly in the case of the May reading achievement motivation scores and teacher ratings. The correlations for the January Indian subgroup are strongly negative, although statements concerning their statistical significance are not appropriate because they contradict the directional hypothesis.

3. Relationship of reading achievement motivation scores to reading achievement test scores: The correlations of the three reading achievement motivation scores obtained in May (attainment value, achievement expectancy, and total) with the four scores from the standardized test of reading achievement (word recognition, comprehending significant ideas, comprehending specific instructions, and total) are shown in Tables XI to XIV. In computing these correlations, the reading achievement test raw scores were used.

For the total group of 53 pupils from whom these scores were available the general pattern is one of low-positive relationship. The highest single correlation is between the attainment value score and the comprehending specific instructions score of the reading achievement test. None of the correlations is statistically significant. The attainment value scores relate slightly more strongly to pupil achievement than the achievement expectancy scores, but the amount of variability thus accounted for in the achievement test scores is quite small.

When the main sample is reclassified in terms of classroom, sex, and racial subgroup, several interesting patterns appear, although again, most of the correlation coefficients do not reach statistical significance.

When the classroom groups are compared, it is noticeable that the relationships are consistently stronger in the case of Room B-1. The attainment value scores again seem to be more strongly related to concurrent reading achievement, and in one instance, the correlation between the attainment value scores and the score from Part III of the reading test is statistically significant. The correlations for Room A-1 tend to be low-positive, and the attainment value-reading test score correlations are slightly larger, but the relationship is very weak. The correlations for the small group of subjects in Room A-2 tend to be negative, particularly in the case of the achievement expectancy scores.

When racial subgroups are compared, some interesting patterns appear. The correlations between the scores of the white subgroup are noticeably stronger and more positive than those of the other two groups. In 42% of the instances these reached the 5% level of significance, and in several other instances, the degree of relationship is close to significance.

TABLE XI: Relationship Between Reading Achievement Motivation Scores and Reading Achievement Test Total Scores (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:53)	.11	.06	.11
Room A-1(N:21)	.11	-.07	.03
Room A-2 (N:8)	.15	-.68	-.16
Room B-1 (N:24)	.26	.15	.24
Boys (N:30)	.11	.04	.09
Girls (N:23)	.26	.15	.24
Indian (N:15)	-.25	-.37	-.36
Negro (N:7)	.03	-.03	.00
White (N:31)	.29	.24	.34*

*p $<$.025

TABLE XII: Relationship Between Reading Achievement Motivation Scores and Scores on Part I of Reading Achievement Test: Word Recognition (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:53)	.04	.06	.06
Class A-1 (N:21)	.05	.02	.05
Class A-2 (N:8)	.17	-.54	-.04
Class B-1 (N:24)	.20	.11	.17
Boys (N:30)	.03	.00	.01
Girls (N:23)	.30	.06	.30
Indian (N:15)	-.28	-.31	-.35
Negro (N:7)	-.09	-.20	-.16
White (N:31)	.17	.24	.27

TABLE XIII: Relationship Between Reading Achievement Motivation Scores and Scores on Part II of Reading Achievement Test: Comprehending Significant Ideas (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:53)	.12	.09	.13
Room A-1 (N:21)	.11	-.02	.06
Room A-2 (N:8)	.17	-.58	-.18
Room B-1 (N:24)	.22	.16	.22
Boys (N:30)	.13	.10	.14
Girls (N:23)	.37*	-.04	.25
Indian (N:15)	-.26	-.34	-.35
Negro (N:7)	.12	.13	.13
White (N:31)	.30*	.23	.34*

$*p < .025$

TABLE XIV: Relationship Between Reading Achievement Motivation Scores and Scores on Part III of Reading Achievement Test: Comprehending Specific Instructions (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:53)	.19	-.01	.11
Room A-1 (N:21)	.16	-.25	-.04
Room A-2 (N:8)	-.06	-.65	-.22
Room B-1 (N:24)	.39*	.19	.33*
Boys (N:30)	.17	.01	.10
Girls (N:23)	.36*	-.14	.18
Indian (N:15)	-.17	-.42	-.34
Negro (N:7)	.07	-.01	.04
White (N:31)	.38*	.17	.34*

*p <.025

The Negro subgroup is very small, and none of the correlations are significant. However, in contrast to the white subgroup, a noticeable number of the correlations are negative, contrary to the prediction of the hypothesis. This tendency toward a negative relationship is even stronger in the case of the Indian pupils.

4. Differences in strength of relationship between measures of reading achievement motivation and reading achievement efforts obtained in January and in May: It was hypothesized that the relationship between reading achievement motivation scores and ratings of reading achievement efforts would be stronger and more positive in May than in January. The testing of this hypothesis involves a comparison of the correlations in Tables IX (January) and X (May). The direction of the differences is contrary to the hypothesis in six of eight instances of the total reading achievement score and reading achievement effort rating correlations. This pattern of differences is characteristic for the attainment value and achievement expectancy part scores as well. Only in the case of the Indian subjects was there a consistent pattern of change in the predicted direction, and here the pattern is from negative to less negative rather than positive to more positive.

D. Criterion-related Validity of Measures of Reading Achievement Motivation and Reading Achievement Efforts and Reading Achievement (Predictive).

1. Relationship between measures of reading achievement motivation and reading achievement efforts: The correlations between reading achievement motivation scores obtained in January and ratings of reading achievement efforts made by teachers in May are shown in Table XV. The January achievement expectancy score correlates positively with reading achievement efforts, although not at a statistically significant level. However, the total score correlation is very small, and the attainment value correlation is not in the predicted direction.

Examination of the correlations that result when the total group available for this analysis is reclassified by classroom group, sex, and race reveals that the strongest positive correlations exist for Room B-1, for girls, and for white pupils. Only in the case of the achievement expectancy score for girls does one of these correlations reach statistical significance. In all instances, the correlations of achievement expectancy scores and reading achievement efforts are stronger and more positive than the other sets of correlations, but in few cases is the relationship of significant strength.

Table XV: Relationship Between Reading Achievement Motivation Scores (January) and Ratings of Pupils' Efforts to Achieve (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:39)	-.16	.18	.02
Room A-1 (N:17)	-.52	-.10	-.37
Room B-1 (N:22)	.09	.36*	.28
Boys (N:25)	-.28	.05	-.03
Girls (N:14)	.04	.14	.11
Indian (N:11)	-.51	.06	-.26
Negro (N:5)	-.22	.16	-.04
White (N:23)	.02	.25	.15

*$p < .025$

2. Relationship of reading achievement motivation scores to reading achievement test scores: The correlations of the three reading achievement motivation scores obtained in January with the four scores from the standardized test of reading achievement administered in May are shown in Tables XVI to XIX. In computing these correlations, the reading achievement test raw scores were used.

For the total group of 45 pupils from whom both sets of scores were available, the general pattern is one of weak relationship. None of the correlations are statistically significant. Most of the correlations are positive, but one is zero and two are negative. The correlations of the achievement expectancy scores with the reading test scores are all positive and slightly higher than those between the attainment value scores and the reading test scores, but both are so small as to be of little practical significance.

When the total sample is reclassified by classroom sex, and race, some interesting patterns appear. For Room B-1, the predictive value of the reading achievement motivation scores is noticeably stronger than for Room A-1. The correlations for Room B-1 are all positive, as hypothesized, and both the achievement expectancy and total achievement motivation scores tend to be correlated to a statistically significant degree with the reading scores. This pattern is true for all instances except that of the achievement expectancy scores and the scores of the comprehending significant ideas section of the reading achievement test where the correlations fall just below the 2.5 level of significance. The relationship between the attainment value scores and the reading achievement test scores is positive but does not approach significance. In contrast, eleven of the twelve correlations for Room A-1 are negative, most rather weak, but in the instance of the comprehending specific instructions part of the reading achievement test, showing considerable strength in the direction contrary to the hypothesis. The relationship in the case of Room A-2 is consistently negative, but the size of the correlations is somewhat offset by the small number of pupils in that subgroup.

For the sex subgroup, the pattern is one of weak relationship. For the boys, the correlations tend to be very low and negative, for the girls, they tend to be very low and positive.

For the racial subgroups, relationships again tend to be weak. The white subgroup correlations tend to be low and positive, while those of the Indian and Negro subgroups tend to be low and negative.

E. Differences in Mean Scores Related to Sample Characteristics:

The scores of the pupils on the twelve variables of interest were analyzed to test the hypotheses of no differences in means related to sex, race, and classroom group or to interactions related

TABLE XVI: Relationship Between Reading Achievement Motivation Scores (January) and Reading Achievement Test Total Scores (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:45)	-.02	.07	.03
Room A-1 (N:17)	-.10	-.24	-.18
Room A-2 (N:7)	-.68	-.57	-.66
Room B-1 (N:21)	.28	.41*	.40*
Boys (N:27)	-.04	-.02	-.03
Girls (N:18)	.02	.03	.03
Indian (N:14)	.04	-.03	.00
Negro (N:5)	-.70	-.50	-.62
White (N:26)	.10	.24	.19

*$p < .025$

TABLE XVII: Relationship Between Reading Achievement Motivation Scores (January) and Scores on Part I of Reading Achievement Test: Word Recognition (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:45)	.01	.07	.04
Room A-1 (N:17)	.10	-.19	-.04
Room A-2 (N:7)	-.57	-.35	-.49
Room B-1 (N:21)	.24	.44*	.40*
Boys (N:27)	.02	.01	.02
Girls (N:18)	.00	-.02	-.01
Indian (N:14)	.04	-.09	-.03
Negro (N:5)	-.74	-.53	-.66
White (N:26)	.15	.27	.23

*$p < .025$

TABLE XVII: **Relationship Between Reading Achievement Motivation Scores (January) and Scores on Part I of Reading Achievement Test: Word Recognition (May).**

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:45)	.01	.07	.04
Room A-1 (N:17)	.10	-.19	-.04
Room A-2 (N:7)	-.57	-.35	-.49
Room B-1 (N:21)	.24	.44*	.40*
Boys (N:27)	.02	.01	.02
Girls (N:18)	.00	-.02	-.01
Indian (N:14)	.04	-.09	-.03
Negro (N:5)	-.74	-.53	-.66
White (N:26)	.15	.27	.23

*$p < .025$

TABLE XVIII: Relationship Between Reading Achievement Motivation Scores (January) and Scores on Part II of Reading Achievement Test: Comprehending Significant Ideas (May)

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:45)	.00	.09	.05
Room A-1 (N:17)	-.10	-.14	-.13
Room A-2 (N:7)	-.57	-.64	-.58
Room B-1 (N:21)	.29	.35	.36
Boys (N:27)	-.01	-.00	-.01
Girls (N:18)	.04	.06	.06
Indian (N:14)	.04	.07	.06
Negro (N:5)	-.72	-.52	-.64
White (N:26)	.14	.23	.20

TABLE XIX: Relationship Between Reading Achievement Motivation Scores (January) and Scores on Part III of Reading Achievement Test: Comprehending Specific Instructions (May).

Group or Subgroup	Attainment Value	Achievement Expectancy	Total
Total (N:45)	-.08	.03	-.03
Room A-1 (N;17)	-.36	-.40	-.42
Room A-2 (N:7)	-.63	-.37	-.66
Room B-1 (N:21)	.31	.38*	.40*
Boys (N:27)	-.14	-.08	-.12
Girls (N:18)	.01	.07	.05
Indian (N:14)	.03	-.10	-.04
Negro (N:5)	-.58	-.40	-.51
White (N:26)	-.07	.15	.05

*$p < .025$

to these factors of classification. The relevant subgroup means are summarized in Table XX. It is to be noted that Negro subjects were dropped from the racial classification because of inadequate cell frequencies, and subjects from Room A-2 from the analyses of ratings of reading achievement efforts because these scores were not available for these subjects. The frequencies for some of the remaining cells (12 to 8 cells depending on the analysis) were as small as 1 in a few cases. However, this analytic procedure was felt to be preferrable to repeated one-way analyses of variance because it permitted testing for significant interactions. A table of all F values appears as Appendix D.

Only for the reading achievement test scores did a main effect, in this case, sex, reach statistical significance. The mean differences between the boys and girls, favoring the girls, were quite large, reaching the .01 level of significance for the total scores and the Part I: Word Recognition, and Part II: Comprehending Significant Ideas sections, and the .05 level for Part III: Comprehending Specific Instructions.

Two significant (105) two-way interactions were found among the means of the May reading achievement motivation scores. These were the only significant interactions emerging from any analysis. One of these involved the achievement expectancy means, and the other, the total reading achievement motivation means. The two groups of means involved are shown in Table XXI.

The sex x race interaction has a clear pattern. The Indian boys' May achievement expectancy score mean is higher than that of the Indian girls while the reverse is true for the white subjects, girls' means being higher than those of boys. This produces a "crossover effect." (The same pattern approached significance for the total score means.) The race x classroom group interaction also resulted from a crossover effect. In this case, the May total reading achievement motivation score means of the white pupils tend to be slightly higher than those of the Indian pupils. This pattern is true for Rooms A-1 and B-1. However, there is a dramatic reversal of this pattern in Room A-2, large enough to produce a statistically significant effect in spite of the small number of subjects involved.

These results indicate that, in general, mean differences in the experimental measures of reading achievement motivation and reading achievement efforts were independent of sex, race, and classroom group. The scores on the standardized test measure of reading achievement, however, showed strong sex group mean differences.

TABLE XX: Subgroup Means Tested for Significant Differences by Analysis of Variance.

	SEX		RACE		CLASSROOM		
	Boys	Girls	White	Indian	B-1	A-2	A-1
January							
Attainment Value	12.08	11.80	12.10	11.67	12.26	13.13	11.16
Expectancy	11.04	12.20	11.58	11.47	12.21	12.13	10.63
Total	23.11	24.00	23.68	23.13	24.47	25.25	21.79
May							
Attainment Value	11.92	11.14	11.84	11.00	12.14	10.86	11.16
Expectancy	10.92	11.87	11.03	12.00	11.68	11.00	11.11
Total	22.85	23.00	22.88	23.00	23.82	21.86	22.27
January Rating	5.45	4.06	4.82	5.46	5.08	-	4.82
May Rating	5.42	3.65	5.04	4.07	4.36	-	5.10
May							
Word Recognition	9.82	18.68	14.78	11.83	12.46	10.57	16.10
Significant Ideas	8.89	18.50	13.25	12.89	14.04	8.43	13.71
Spec. Instructions	6.89	10.36	9.25	7.00	7.91	4.86	10.14
Total Achievement	25.61	47.54	37.25	31.72	34.41	23.86	39.95

TABLE XXI: Means Involved in Significant Interactions.

May Expectancy Scores

(Sex x Race Interaction)

	White	Indian
Boys	10.47	12.80
Girls	12.00	11.63

$p < .05$

May Total Scores

(Sex x Room Interaction)

	White	Indian
A-1	22.46	21.50
A-2	19.00	24.00
B-2	24.14	23.25

$p < .05$

F. Summary of Results.

1. Test-retest reliability of measures: The reading achievement motivation total scores showed moderate stability for both the short (January - March) and long (January - May) periods. The attainment value scores were more stable than the achievement expectancy scores. This tended to be true for most subgroups, although the pattern varied.

Teachers' ratings of pupils' reading achievement efforts were moderately stable.

2. Construct validity of measures of reading achievement motivation: Contrary to the hypothesis that the attainment value scores would be independent of the achievement expectancy scores, these two sets of scores showed a moderately strong degree of relationship. However, the degree of relationship was much less strong in May than in January.

3. Criteron-related validity of measures of reading achievement motivation and measures of reading achievement efforts (concurrent): Except for the case of the girls' subgroup, teachers' May ratings of pupils' reading achievement efforts were moderately related to their reading achievement test scores.

The relationships between reading achievement motivation scores and reading achievement efforts were often negative in both January and May, contrary to the hypothesis. The pattern is low positive for the subgroups of Room B-1, girls, and Negro and white pupils in January, but these positive relationships have become negative in May.

A pattern of weak positive relationship that seldom reached statistical significance emerged from the correlations of May reading achievement motivation scores and May reading achievement test scores. This pattern was stronger for attainment value scores than for achievement expectancy scores. The pattern of positive relationship was somewhat stronger in the case of Room B-1 than in the other two classrooms, for girls rather than boys, and for the white pupil subgroup. A persistent negative relationship, contrary to the hypothesis, existed for the Indian subgroup.

It was hypothesized that the relationship between reading achievement motivation scores and ratings of reading achievement efforts would be stronger and more positive in May than in January. The direction of the relationships in the analyzed data is contrary to this hypothesis in most instances.

4. Criterion-related validity of measures of reading achievement motivation and reading achievement efforts and reading achievement (predictive): When the reading achievement motivation scores obtained in January were correlated with ratings of reading achievement efforts made in May, the correlations of achievement expectancy scores and reading achievement efforts are stronger and more positive than the sets of correlations involving the attainment value and total reading achievement motivation scores. But, in few cases is the relationship of significant strength. The direction of relationship in a number of the attainment value correlations is not in the predicted positive direction.

When the correlations between the reading achievement motivation scores obtained in January and the scores from the standardized test of reading achievement administered in May are compared, the general pattern is one of weak relationship. Most of the correlations are positive, and those between the achievement expectancy scores and the reading test scores tend to be slightly more positive and larger than those between the other sets of scores. In the context of a general pattern of weak relationship, the positive relationship tends to be stronger in the case of Room B-1, girls, and the white subgroup.

5. Differences in mean scores related to sample characteristics: Significant mean differences favoring the girls were found in the reading part and total test scores. No other significant mean main effects were found. Only two significant interactions were found. The Indian boys' May achievement expectancy score mean was higher than that of the Indian girls while the reverse was true for the white subjects. In a race x classroom group interaction involving the May total reading achievement motivation score means, the means of the white pupils were higher than those of the Indian pupils in Rooms A-1 and B-1, but there was a strong reversal of this pattern in Room A-2.

IV. DISCUSSION

The main purpose of this study was to explore the practical value of a procedure for measuring the motivation of first-grade children from low-income families to achieve in reading. To be of practical value, the reading achievement motivation scores obtained through this procedure should have moderate reliability and be moderately related to appropriate criteria such as efforts to achieve in reading and reading achievement test scores. What do the results of the investigation tell us about the reliability and validity of the reading achievement motivation scores?

The three reading achievement motivation scores, the attainment value score, the achievement expectancy score, and the total score, all show weak to moderate test-retest reliability for the total group, and most of the subgroups. The stability of the attainment value scores was higher than that of the achievement expectancy scores. Given the complex pattern of perceptions and personality traits that enter into the shaping of motivational attitudes and their apparent sensitivity to situational factors, the reliability of at least the attainment value scores seems satisfactory. It compares favorably with that of other measures of achievement motivation, such as projective measures of n Achievement (16). In general, the reliability of the measures appears adequate to justify a consideration of their validity.

Data relating to three aspects of the validity of the reading achievement motivation scores were collected. The first aspect concerned the construct validity of the two part scores, that for attainment value and that for achievement expectancy. The hypothesis that these two scores would be independent of one another was not supported. Examination of the results indicates that there was a moderately strong relationship between the two part scores in January. The relationship was much weaker in May, and since a substantial amount of the variability of the scores is left unaccounted for, it is not unreasonable to believe that the two part scores, while not "pure," to a considerable degree tap different aspects of motivation to achieve in reading.

The other two aspects of validity examined were the concurrent and predictive relationship of the reading achievement motivation scores to two criterion measures, pupils' reading achievement efforts and their reading achievement test scores. Teachers' ratings of their pupils' reading achievement efforts made using a forced stanine procedure were moderately reliable, and reading achievement efforts and reading achievement test scores were moderately related as had been hypothesized. However, the relationships between the reading achievement motivation scores and these criterion measures were not impressive. The general pattern of correlation was positive as had been hypothesized, but the relationships were usually weak and negative relationships were not infrequent. In general, attainment value scores related slightly more strongly to concurrent efforts and achievement than did achievement expectancy scores. Achievement expectancy scores, however, related slightly more strongly to future efforts and achievement than did attainment value scores. Given the greater stability of the attainment value scores, one might have expected that they would be less sensitive to changes in achievement and efforts over time than the expectancy scores, thus correlating less strongly with concurrent criterion measures. This was not the case. However, other explanations can be tentatively offered. It may be that attainment value scores reflect a pupil's objective perceptions of the importance of reading and his relative rank in his class, cognitive aspects of motivation that presumably change slowly over time and yet reflect current relative standing to a considerable degree. On the other hand, the achievement expectancy scores may tap more subjective, affective aspects of motivation, perhaps appropriately labeled "aspiration," which change more over time but also influence striving to achieve, and thus relate more strongly to such changes in relative position as do occur over time. Because the trends in the data were so weak, such explanations are extremely speculative.

Why were the reading achievement motivation scores not more strongly related to reading achievement efforts and reading achievement? There are several possible explanations. One is that the measuring procedure is measuring some general motivational predisposition of which reading achievement motivation is only a small part. In other words, the measurements produced are too gross and general to relate strongly to efforts and achievement. This is probably the most parsimonious explanation. Another possible explanation, however, is suggested by the comments of Klinger (17). Klinger pointed out that in most studies of n Achievement in which that motivational construct was measured in situations likely to arouse strong feelings about performance (in schools, for example), little relationship was found with actual performance. However, where measures were obtained in more neutral situations, the correlations with actual performance were stronger and statistically significant.

How might this be explained and related to the present investigation? Presumably, the most likely explanation is that subjects whose actual achievement efforts and achievement are relatively low or unsuccessful, pick up the situational clues stressing the importance of achievement motivation in the classroom and generalize them to the school-related testing situation. This would cause them to report strong achievement motivation not necessarily related to actual performance. Several scattergrams were plotted for the data collected in this investigation. They showed a suggestive U-shaped pattern produced by a tendency of both very high and very low achievers to have high reading achievement motivation scores (See Appendix E). In the absence of further investigation, this proves nothing, but it does point out a direction for further research.

A third possible interpretation of the results obtained would stress the age of the subjects. Young subjects such as those in this sample may not be sensitive to discrepancies between fantasy achievement motivation and actual achievement behavior. The existence of a cultural press toward the aggressive affirmation of competence on the part of lower-class males may cause an intensification of this tendency in the boys in the sample.

There is yet aspect of the data that may bear on the lack of relationship found. The overall reading achievement of the pupils in this sample was quite high for children from a low-income area. The average grade score for Room A-1 was 2.25, for A-2, 1.80, and for B-1, 2.06. Some question might be raised about whether or not these rooms were typical of most classrooms serving children like those in the sample. It is possible that these were classes in which superior teachers had been successful in producing unusually high motivation to achieve in reading on the part of all pupils. Regardless of actual achievement, every pupil wished to do well and hopefully affirmed that he expected to do well. The investigator has a subjective impression that this may have been the case, and the mean motivation scores are consistently high for all groups.

There are some other aspects of the analysis that bear discussion. One is the generally stronger correlations in the case of the girls' scores as compared to the boys' scores. This pattern is the opposite of that reported by Stiles (28). A possible explanation is related to the fact that the boys' mean reading achievement test scores were significantly lower than those of the girls. More boys than girls then fell into the group of low achievers whose reports of their attainment value and expectancy reflected a strong feeling that it was important to express positive motivation to achieve in reading. Again, retrospective inspection of scattergrams provides some support for such an interpretation (See Appendix E).

The persistently negative correlations for the Indian subgroup present a puzzling problem. Inspection of scattergrams suggests that this may be a special case of the low-achievement sex effect already mentioned (Appendix E). The investigator is tempted to speculate about differences related to cultural background, but knows of no research bearing directly on this point. Certainly, the findings suggest the importance of checking further on motivational differences related to Indian minority group membership.

The results of the investigation can be summed up as follows: The measuring procedure yielded scores that had an adequate degree of reliability to be useful measures of achievement motivation. However, these scores provd to be of questionable validity. The two part scores of reading achievement motivation were slightly interrelated rather than independent, as was theoretically desirable, and none of the reading achievement motivation scores was consistently strongly related to either reading achievement efforts or reading achievement test scores. While one possible conclusion is that the scores reflect something other than reading achievement motivation, there is some evidence in the data to support a hypothesis that situational factors, particularly a strong stress on the desirability of reading efforts and achievement by the teachers whose rooms were involved in the study, may have influenced the pattern of relationships. Such a hypothesis receives additional support from Klinger's conclusions following his analysis of the results of studies of the correlation of n Achievement scores with actual performance (17). However, testing such a hypothesis was outside the design of this investigation.

The chief effect noticed in an analysis of the significance of mean score differences related to pupil characteristics (sex, race, and classroom group) was one of sex differences in reading achievement test scores. Although boys and girls did not differ in mean reading achievement motivation scores, they differed greatly in actual reading achievement. The boys' reading achievement test mean scores were significantly lower than those of the girls. This reflects the pattern already noted in the data, the tendency of the boys to respond so as to receive relatively high reading achievement motivation scores regardless of the level of their actual reading achievement efforts as perceived by their teachers or their reading achievement test performance.

V. CONCLUSIONS

The results of this investigation did not support acceptance of the overall hypotheses of statistically significant relationship between the experimental measures of reading achievement motivation and reading achievement efforts and achievement in the sample of first-grade children from low-income families tested. The scores yielded by the measure of reading achievement motivation and the teacher ratings of reading achievement efforts proved to be relatively stable over time, but the validity of the measures of two hypothesized aspects of the cognitive-affective dimension of reading achievement motivation was not supported when ratings of reading achievement efforts and reading achievement test scores were used as validating criteria. Basing his conclusion on the results of this study, the investigator could not say that the motivational scores obtained had great theoretical or practical value as predictors of the reading achievement of children such as those in the sample.

However, careful inspection of the raw data thrown into the form of scattergrams and study of the patterns of weak relationship found led to the formulation of some hypotheses that should be tested in further research. One area for investigation is that of sex differences in the motivation scores.

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However, careful inspection of the raw data thrown into the form of scattergrams and study of the patterns of weak relationship found led to the formulation of some hypotheses that should be tested in further research. One area for investigation is that of sex differences in the motivation scores.

Boys' reading achievement motivation scores were consistently weaker than those of girls. Inspection of scattergrams suggests that this effect may be confounded with low reading achievement. There appears to be a tendency for the reading achievement motivation scores of low-achieving boys to be negatively rather than positively related to their reading achievement. From a theoretical if not practical point of view, it would appear useful to pursue this finding further, determining whether or not it is a true effect or merely a chance occurence in the data from this sample. The investigator also has a subjective impression that this effect may be related to the strong stress placed on reading achievement by the teachers from whose rooms the sample was drawn.

Another trend in the data that seems worthy of further study is the tendency for negative relationships to exist between the reading achievement motivation scores and reading achievement efforts and achievement of the American Indian children in the sample. Inspection of scattergrams suggests that this may be a special case of the sex-related low achievement effect already mentioned, but it is possible that it is related to distinctive features of the Indian subculture. Is the fact that high-achieving Indian girls expressed relatively moderate motivation to achieve related to the high drop-out rate among Indian adolescents? At the high school which the children in this sample will eventually attend, the drop-out of Indian students is virtually 100%. A counselor at this high school reports that two eleventh grade Indian girls dropped out at the beginning of the second semester last year after being on the honor roll for the fall semester. They were the last Indian students in their grade. All others had dropped-out earlier. Such questions seem deserving of more study than permitted by the design of the present investigation.

One clear finding emerges serendipitously from this investigation. Whether or not the pupils sampled varied in motivation as they varied in reading achievement, they placed a high positive value on successful achievement in reading and affirmed a positive expectancy about their performance in reading-related situations. The charge sometimes made that children from low-income families are "unmotivated" and "uninterested in achievement" certainly does not characterize the children in this sample.

VI. SUMMARY

Children from low-income families achieve less well in school than children from middle-income families. Many factors, some of which may affect motivation to achieve in school, have been hypothesized as responsible for this difference in achievement. Research on possible differences in motivation has been hampered by a shortage of appropriate psychometric procedures. The primary focus of the present study was on the reliability and validity of a measurement procedure that showed promise for use with young children. Validity in this context was defined in terms of the relationship of achievement motivation scores to achievement efforts and actual achievement in the area of reading.

Drawing on a theory of achievement motivation in young children proposed by Crandall, Katkovsky, and Preston (6), the investigator developed a procedure for determining the "attainment value" children placed on achievement in reading and their "expectancy" for reading achievement. Pupils' attainment value and achievement expectancy scores, and a total reading achievement motivation score obtained by summing these two scores, were determined on the basis of the order in which they placed small figures of boys and girls on four steps in response to questions about participation in different achievement-oriented reading situations. These three reading achievement motivation scores were correlated both with ratings of achievement efforts made by teachers and with reading achievement test scores.

The sample for the study consisted of 70 first-grade children from three classrooms in two schools in the poverty target area of Minneapolis, Minnesota. Complete data were not available for all 70 pupils because of transiency and absenteeism. The sample contained substantial numbers of both American Indian and white children and a small number of Negro children. Data were collected in January and May, and from a subgroup of the sample, in March. The data were analyzed for relationships using product moment correlational procedures and for mean differences between subgroups of the sample by analysis of variance procedures.

The reading achievement motivation scores showed moderate stability over a short time period (January to March) for a subgroup of the total sample and over a longer time period (January to May) for all children available for testing in both periods. The attainment value score was more stable than the achievement expectancy score.

Ratings of pupil achievement efforts were obtained in both January and May. Correlating the reading achievement motivation scores with these ratings to obtain an estimate of concurrent criterion-related validity yielded very low correlation coefficients. There was some tendency for the attainment value scores to correlate more strongly with efforts than the achievement expectancy scores. May reading achievement motivation scores were correlated with scores on a standardized test of reading achievement also administered in May to obtain another indication of concurrent criterion-related validity. Again the correlations were low with similar patterns in the case of the two part scores.

When January reading achievement motivation scores were correlated with May ratings of achievement efforts and reading achievement test scores, the pattern of relationship was again weak, although in this instance, the achievement expectancy scores correlated somewhat more strongly than the attainment value scores.

When the total group available for each correlational analysis was broken down into subgroups by sex, by classroom, and by race (Indian, Negro, and white), no subgroup showed consistently strong relationships between the reading achievement motivation scores and the criterion measures. Somewhat stronger relationships were found for the pupils in one of the three classrooms when compared with the other two, for girls when compared with boys, and for white subjects when compared with Indians and Negroes. Few of the correlation coefficients obtained reached the level required for statistical significance (.05 or .025 depending on the hypothesis being tested), and none were strong enough to indicate value as a practical predictor of reading achievement efforts or achievement.

When differences between the means of the subgroups (classroom, sex, and race) were tested for significance (.05 level), few significant differences were found. The subgroups did not vary in mean reading achievement motivation scores or mean rating of achievement efforts, although two two-way interactions were found in the analyses of the May reading achievement motivation scores. However, significant mean differences for the main effect of sex favoring the girls were found for the three mean part scores and the mean total score of the reading achievement test.

Several interpretations of the findings were suggested. One was that the procedure does not tap reading achievement motivation to a significant degree. Another, drawing from Klinger's review of the research on measures of fantasy need

Achievement (17), was that possibly real differences in fantasy reading achievement motivation were vitiated by the fact that testing was done in a situation containing cues that might arouse achievement fantasy. Study of scattergram patterns indicating that both very high-achieving and very low-achieving pupils reported high reading achievement motivation while middle achievers reported moderate reading achievement motivation gave some support to such an hypothesis. This pattern for high and low-achieving readers appeared to be confounded with a sex effect resulting from the lower mean reading achievement of the boys. A tendency for the scores of children in the Indian subgroup to correlate negatively with reading achievement efforts and reading achievement was also discussed and suggested as worthy of further study.

While this investigation grew out of an interest in the relative strength of the motivation to achieve of children from low-income families when compared with children from middle-income families, it focused not on such a comparison but on the usefulness of a proposed procedure for measuring such motivation in young children. The results of the investigation were discouraging when viewed in terms of this basic purpose, but it was suggested as a serendipitous finding that the responses of the children to the questions about motivation to achieve in reading indicated that, however their motivation scores might relate to those of children from middle-income families, they did not seem unmotivated, regardless of their actual achievement.

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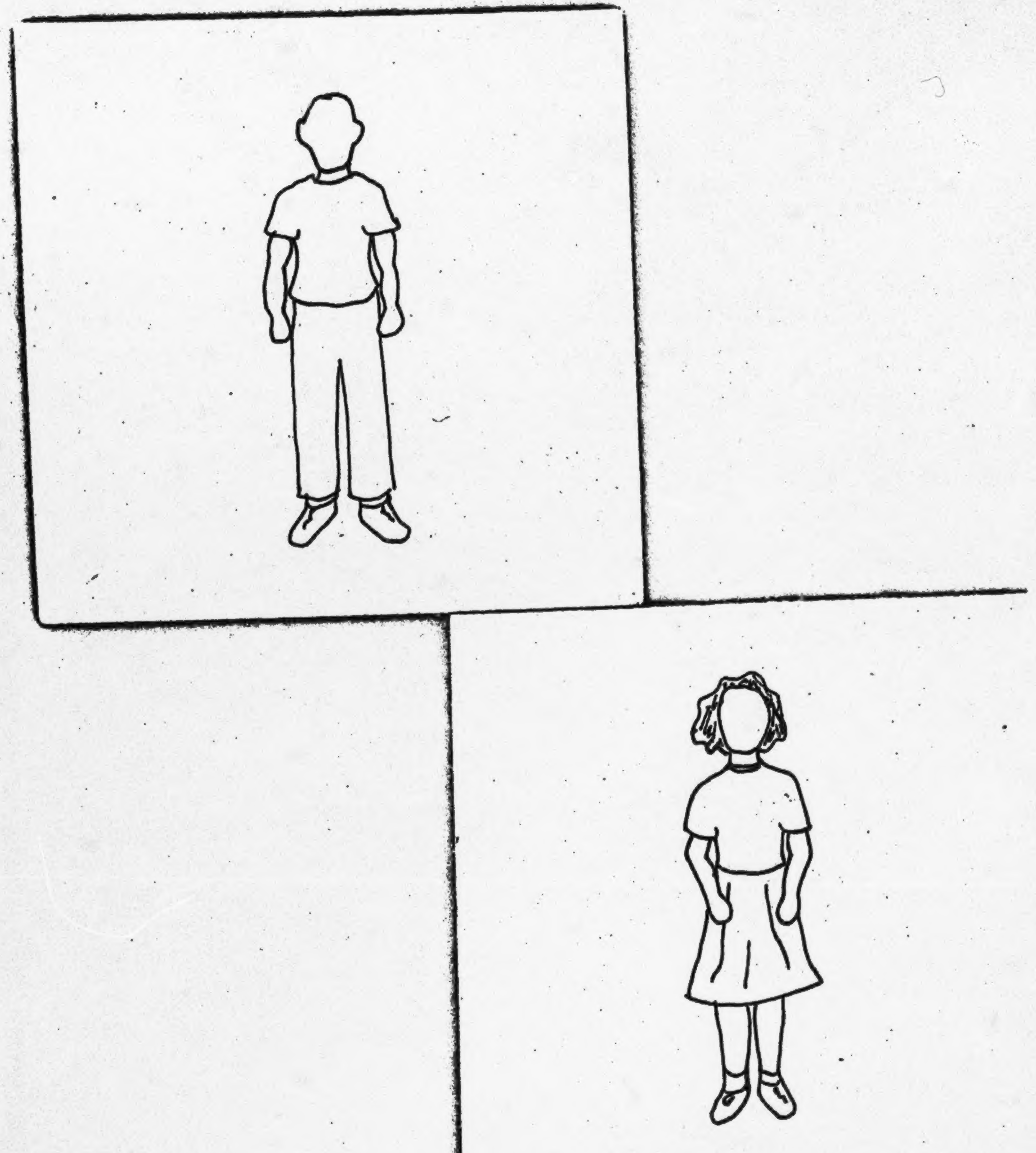
APPENDIXES

APPENDIX A: MATERIALS AND PROCEDURE USED IN MEASURING READING ACHIEVEMENT MOTIVATION.

Figures Used in Measuring Reading Achievement Motivation



Questions and Introductory Statements Used in Measuring Reading Attainment Value and Reading Achievement

Here are pictures of some children like the boys and girls in your room. Let's imagine that they are at school and the teacher is calling some children to a group to learn to read:

(1A) Which one of the children wants most to learn to read with the group?**

(1B) Which one is best at reading with the group?

After they read the story in their books, the teacher will ask some questions about it:

(2A) Which one of the children wants most to answer questions about what they read in their books?

(2B) Which one is best at answering questions about what they read in their book?

Now they are going to read the story out loud to the other children:

(3A) Which one wants most to read the story out loud to the other children?

(3B) Which one is best at reading the story out loud to the other children?

Now is the time for the children to go back to their desks to work on their reading workbooks:

(4A) Which one wants most to do reading workbooks at their desk?

(4B) Which one is best at doing reading workbooks at their desk?

**After each question, the children are guided in ordering the four figures on the steps and asked, "Which one is most like you?"

Standard Interview Procedure for Obtaining Answers to Questions About the Attainment Value Placed on Successful Achievement In Reading and the Expectancy for Such Achievement

The experimenter and the subject are seated side-by-side before a low table. A heavy card with four steps (each 4" wide with a 2" rise) is placed before them on an easel. Four figure cards (two boys and two girls) are laid out on the table before the subject.

The experimenter encourages the subject to look at the cards and handle them. He says, "Here are four pictures. Two of them are of boys (girls) like you, and the others are of two girls (boys). We're going to play a game in which I'll ask some questions and you'll answer with the cards. Let me tell you how to do it."

The experimenter now arranges the cards in the order B-G-G-B, ignoring differences in color of clothing. The experimenter rearranges the cards in a different order before asking each question. Four orderings are used: B-G-G-B (1A, 3A); G-B-G-B (1B, 3B); G-B-B-G (2A, 4A); B-G-B-G (2B, 4B).

The experimenter now says, "Here are pictures of some children like the boys and girls in your room. Let's imagine that they are at school and the teacher is calling some children to a group to learn to read. Which one of the children wants most to learn to read with the group? (See question 1-A in Appendix A-2. Experimenter indicates the four figures. After the child indicates one, the experimenter continues.) . . . All right. This one wants most to read so we'll put him (her) here on the top step. Now, which one of the children who are left wants most to learn to read with the group? (After the child indicates one, the experimenter continues.) . . . All right. I'll put this one on the second step since he (she) didn't want to read quite so much as the first one. Now, which one of these two children wants most to learn to read with the group? (After the child indicates one, the experimenter continues.) . . . All right. I'll put this one here (indicating third step). And, since this (last) boy (girl) didn't want to learn to read with the group so much, I'll put him (her) here (on the bottom step)." (If the child spontaneously begins to place the figures himself, he is permitted to do so, but this in not required.

The experimenter continues, "Now, if this boy(girl) indicating the figure on the highest step which is the same sex as the subject, wants most to learn to read with the group and this boy (girl) the next most. And this one the next most. And this one the next most. Which one is most like you?" Experimenter waits until child indicates one of the figures.

The experimenter then records the order of the figures on the steps from top to bottom (written left ot right) and encircles the one to which the subject pointed. Example: B-B-G-G. When scoring, the subject's score is determined by the stop occupied by the figure to which he points. Pointing is scored with the top step being given the highest score: 4-3-2-1.

The figure cards are taken down and rearranged in front of the subject. The session continues with the questions listed in Appendix C being asked in the following order: 1-A, 1-B, 2-A, 2-B, 3-A, 3-B, 4-A, 4-B.

APPENDIX B: FORCED STANINE PROCEDURE USED BY TEACHERS IN RATING PUPIL' EFFORTS TO ACHIEVE IN READING.

Procedure Followed in Obtaining Forced Stanine Ratings

1. The number of pupils enrolled in a given class was obtained by consulting the class roll.

2. On a blank sheet of paper, the investigator wrote the numbers 1 through 9 along the left hand margin. One blank for each pupil was placed to the right of the numbers with as close an approximation as possible to a normal distribution. Thus, 1 and 9 usually had only one blank, and the greatest frequency of blanks fell at 5.

3. The teacher was given the instructions reproduced on page B-2. After she had had an opportunity to study them, she was encouraged to ask any questions that might remain unanswered.

4. The teacher completed the forced stanine ratings at her own convenience but within one week of the other testing and returned the rating sheet to the investigator.

5. In scoring the ratings, the ordering of scores was the reverse of the ordering of the blanks. Thus, a 1 rating was scored as a 9, etc. This procedure was followed to avoid the confusion of negative correlations of reading achievement efforts with reading achievement test scores that would otherwise have resulted.

STANINE PROCEDURE FOR RATING PUPILS ON EFFORTS TO ACHIEVE IN READING

Directions: In making assignments to the ranks in the distribution, your basic focus should be on effort to achieve in reading rather than actual reading achievement. You will sometimes have a difficult choice to make between different pupils. In making your dicision, think about their efforts to learn to read rater than just how well they do in reading.

Efforts to achieve in reading may be shown by such behavior as:

.... Eagerness to participate in reading activities.

.... Interest in working on reading workbooks or reading readiness materials.

.... Persistence in working on reading and reading-related tasks.

.... Eagerness to talk about things which have been read by others.

.... Interest in looking at books and stories independently.

Follow these directions in rating your pupils:

Step 1: Read over the list of pupils carefully so as to familiarize yourself with the entire group.

Step 2: From the list, choose the two or three pupils you feel make the greatest efforts to achieve in reading according to the above criteria. Write their names in the top row of blanks (1) in pencil.

Step 3: From the list, choose the two or three pupils you feel make the least efforts to achieve in reading according to the above criteria. Write their names in the bottom row of blanks (9) in pencil.

Step 4: Now, choose the pupils who make the next greatest efforts to achieve in reading according to the above criteria. Write their names in the row of blanks next to the top row (2).

Step 5: Now, choose the pupils who make the next least efforts to achieve in reading according to the above criteria. Write their names in the row of blanks next to the bottom row (8).

Step 6: Continue this process, alternating between the groups of pupils making more and less effort to achieve in reading until you have rated all of the class. The middle row of blanks (5) should contain the names of the pupils whom you feel are average in the effort they make to achieve in reading.

Important Note: Feel free to erase and make changes as you work through the rating porcess. Your considered judgment is what we want.

APPENDIX C: RATING SCALE PROCEDURE FOR RATING READING ACHIEVEMENT EFFORTS AND SUMMARY OF RESULTS OBTAINED USING THIS PROCEDURE.

Rating Scale Procedure for Rating Reading Achievement

Efforts

The Rating Scale Procedure:

Several researchers with whom the investigator consulted while planning this study raised questions about the use of the forced stanine procedure as a method for rating pupils' reading achievement efforts. These questions concerned the reliability of the measure and the possible positive or negative bias it might produce in correlations with the other measures being used. For comparative purposes, the investigator designed the rating scale shown on Page C-2 and the teachers completed it at the time of the January and May testing periods.

Results:

The test-retest reliability (January-May) of the rating scale scores was .61. The overall correlation of ratings of individual pupils on the rating scale and forced stanine was -.67 in January and -.80. (The negatively-signed correlations indicate positive relationship because a high rating scale score signifies relatively low effort.) Most of the subgroup correlations were also strong.

The correlation of the total group rating of efforts to achieve in reading with the reading achievement test total score was -.35 with correlations with the part scores ranging from -.27 to -.37. These correlations are most easily understood by ignoring the sign. They indicate a strength of relationship similar to that between the forced stanine ratings and achievement test scores, tending to be a few points lower in all instances.

The correlations between rating scale scores and reading achievement motivation scores were similar to those between forced stanine ratings and reading achievement motivation scores, weak with a tendency to positive relationship in most instances. It was concluded that the results of this investigation would not have been greatly different if the rating scale procedure had been used instead of the forced stanine procedure.

RATING SCALE FOR RATING READING ACHIEVEMENT EFFORTS

School-Room Number ________

Pupil ________

Directions: Write the name of the pupil you are going to rate in the space provided. Rate the pupil on each of the characteristics below by marking the spot on the scale which best describes his behavior as you have observed it in the classroom.

Eagerness to participate in reading activities:

Very eager :_____:_____:_____:_____:_____: Not at all eager.
1 2 3 4 5 6

Persistence in working on reading and reading-related tasks:

Very Persistent :_____:_____:_____:_____:_____: Not at all persistent.
1 2 3 4 5 6

Interest in looking at books and other reading materials independently

Very interested :_____:_____:_____:_____:_____: Not at all interested.
1 2 3 4 5 6

Interested in listening to stories read by others:

Very interested :_____:_____:_____:_____:_____: Not at all interested.
1 2 3 4 5 6

APPENDIX D: VALUES OF "F" STATISTIC FOR THREE WAY ANALYSES OF VARIANCE ON 12 SETS OF SCORES.

Sets of Scores Analyzed by Three Way Analyses of Variance

Reading Achievement Motivation Scores:

1. January Attainment Value Scores.
2. January Achievement Expectancy Scores.
3. Total Reading Achievement Motivation Scores.

4. May Attainment Value Scores.
5. May Achievement Expectancy Scores.
6. Total Reading Achievement Motivation Scores.

Ratings of Reading Achievement Efforts:

7. January Ratings of Reading Achievement Efforts.
8. May Ratings of Reading Achievement Efforts.

Reading Achievement Test Scores:

9. Scores from Part I: Word Recognition.
10. Scores from Part II: Comprehending Significant Ideas.
11. Scores from Part III: Comprehending Specific Instructions.
12. Total Reading Achievement Test Scores.

Values of "F" Statistic for Three Way Analyses of Variance for 12 Sets of Scores

Set Number					Source of Variance		
	Sex (S)	Race (R)	Classroom(C)	S x R	S x C	R x C	S x R x C
(1)	2.79	0.65	3.19	0.75	1.30	0.10	0.30
(2)	0.08	0.01	0.17	0.33	1.99	0.90	1.02
(3)	0.55	0.25	2.12	0.65	2.08	0.38	0.72
(4)	0.85	0.00	0.90	0.62	0.80	1.64	0.89
(5)	1.37	3.25	0.59	4.40*	0.66	2.39	1.89
(6)	0.03	1.34	0.94	3.47	0.47	3.29	2.22
(7)	2.85	0.65	0.01	0.06	0.16	0.23	0.69
(8)	2.73	0.29	0.71	0.52	0.63	0.80	0.02
(9)	12.12**	1.34	2.66	0.96	0.09	0.18	0.46
(10)	11.92**	0.41	1.95	0.00	0.26	0.06	0.46
(11)	5.20*	0.53	1.70	0.59	0.17	0.27	0.98
(12)	11.51**	0.84	2.29	0.02	0.19	0.09	0.66

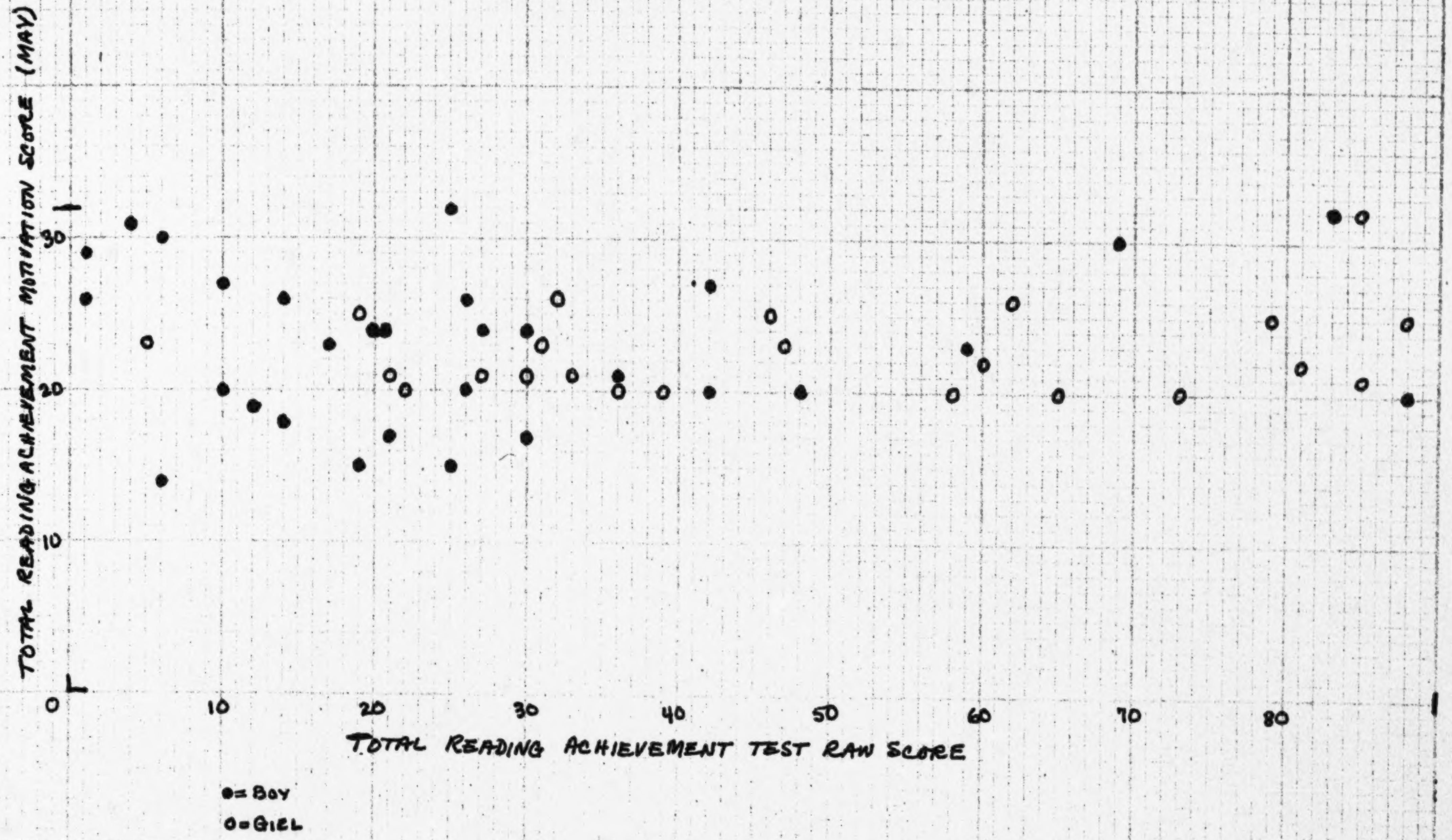
* $p < .05$
** $p < .01$

Degrees of Freedom for "F" Statistic for Three Way Analyses of Variance for 12 Sets of Scores

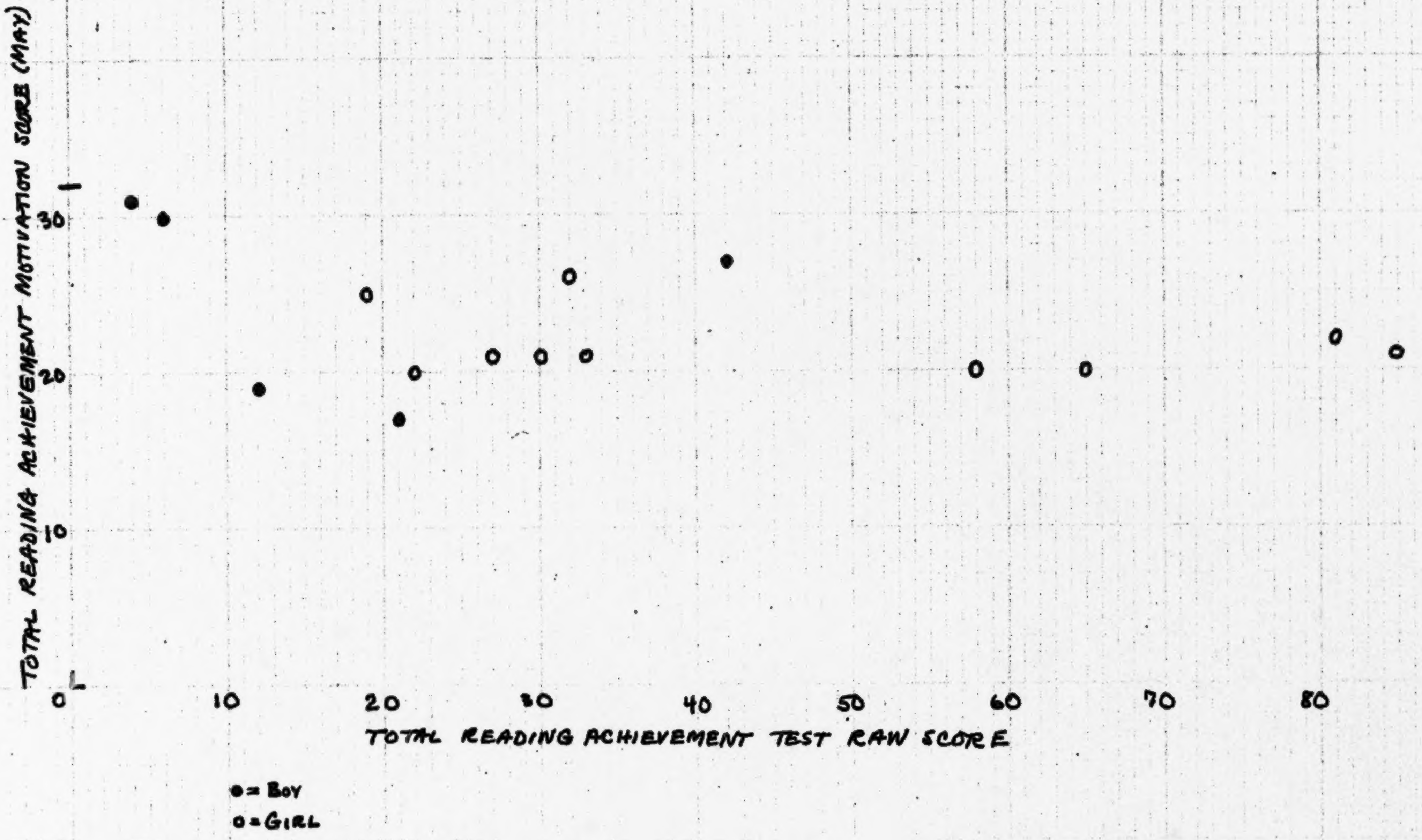
Set					Source of Variance		
Number	Sex (S)	Race (R)	Classroom (C)	S x R	S x C	R x C	S x R x C
(1)	1/34	1/34	2/34	1/34	2/34	2/34	2/34
(2)	1/34	1/34	2/34	1/34	2/34	2/34	2/34
(3)	1/34	1/34	2/34	1/34	2/34	2/34	2/34
(4)	1/36	1/36	2/36	1/36	2/36	2/36	2/36
(5)	1/36	1/36	2/36	1/36	2/36	2/36	2/36
(6)	1/36	1/36	2/36	1/36	2/36	2/36	2/36
(7)	1/36	2/36	1/36	2/36	1/36	2/36	2/36
(8)	1/35	1/35	1/35	1/35	1/35	1/35	1/35
(9)	1/38	1/38	2/38	1/38	2/38	2/38	2/38
(10)	1/38	1/38	2/38	1/38	2/38	2/38	2/38
(11)	1/38	1/38	2/38	1/38	2/38	2/38	2/38
(12)	1/38	1/38	2/38	1/38	2/38	2/38	2/38

APPENDIX E: SCATTERGRAMS FOR TWO SETS OF SCORES

APPENDIX E-1: Scattergram of Scores of Total Group: Total Reading Achievement Motivation Score and Total Reading Achievement Test Raw Score (r=.11).



APPENDIX E-2: Scattergram of Scores of Indian Subgroup: Total Reading Achievement Motivation Score and Total Reading Achievement Test Raw Score (r=-.36).


TOTAL READING ACHIEVEMENT MOTIVATION SCORE (MAY)
30
20
10
0
10
20
30
40
50
60
70
80
TOTAL READING ACHIEVEMENT TEST RAW SCORE
● = BOY
o = GIRL